

the Co.eopterous genus *Rhipidius* (= *Symbius*), which is parasitic in Cockroaches, as the Strepsiptera in Bees and Wasps, and the vermiform female of which does not quit the body of the animal in which it has been developed, any more than the worm-like female of the Strepsiptera. But the Strepsiptera agree with the Meloïdæ (*Meloë* and *Sitaris*, and probably also with *Rhipidius*, the metamorphosis of which is not completely known) in the very remarkable process of development named *hypermetamorphosis* by Fabre, which has hitherto been observed in this form only in the Meloïdæ and Strepsiptera—a process which consists in the production from the egg of a provisory larva, destined to transfer the animal into those conditions under which it is further developed, and in the production from this provisory larva, at the first moult, of a second definitive larva of totally different form.

PROCEEDINGS OF LEARNED SOCIETIES.

ZOOLOGICAL SOCIETY.

April 12, 1864.—E. W. H. Holdsworth, Esq., in the Chair.

NOTES ON THE UROTRICHUS. BY J. K. LORD, F.Z.S.

UROTRICHUS GIBBSII, Baird.

Hab. Western side of Cascade Mountains, Sumass Prairie, near Fraser River.

This singular little animal, which appears to be an intermediate link between the Shrew and the Mole, is at present only known as an inhabitant of two parts of the world, widely removed from each other—the one spot being the western slope of the Cascade Mountains in North-west America, the other Japan. There are, as far as I know, but two specimens extant from the Cascade Mountains,—one in the Smithsonian Museum at Washington; the other, a very fine specimen, that I have recently brought home, and which is now in the British Museum. I have carefully compared the Japanese *Urotrichus* with his brother from the western wilds, and can find no difference whatever, either generically or specifically; in shape, size, and colour they are exactly alike.

The *Urotrichus* is of a bluish black when *fresh*, but in the dried specimens sooty brown. The hair is lustrous and where it reflects the light has a hoary appearance, and, like that of the Mole, can be smoothed in either direction. This is a wise and admirable arrangement, as it enables him to back through his underground roads, as well as to go through them head first. His nose or snout is very curious, and much like that of a pig, only that it is lengthened out into a cylindrical tube covered with short thick hairs, and terminating in a naked fleshy kind of bulb or gland; this gland is pierced by two minute holes, which are the nostrils. Each nostril has a little fold

of membrane hanging down over it like a shutter, effectually preventing sand and small particles of dust from getting into his nose whilst digging. This curious nasal appendage is to him not only an organ of smell, but also serves the purpose of hands and eyes. His fore feet, as I shall by-and-by show you, are wholly digging-implements, and, from their peculiar horny character, not in any way adapted to convey the sense of touch. Eyes he has none, and but a very rudimentary form of ear; so that his highly sensitive, moveable nose serves him admirably in the dark tunnels in which his time is passed to feel his way and scent out the lower forms of insect-life on which he principally feeds. Had he eyes, he could not see, for the sunlight never peeps in to cheer his subterranean home; and sound reaches not down to him; but his nose in every way compensates for all apparent deficiencies. His fore feet are, like the Mole's, converted into diggers; the strong scoop-shaped nail, like a small garden-trowel, at the end of each toe enables him to dig with wonderful ease and celerity. The hind feet are shaped into a kind of scraper, by the toe being curiously bent. The length of the hind foot is about two-thirds more than that of the fore or digging hand.

When I come to speak of his habits as differing from the Mole, I shall be able to demonstrate the use of this strange scraper-like form of hind foot. So far, I have endeavoured to give an outline of his general personal appearance, differing from the Shrew in the peculiar arrangement of his feet, and from the Mole in having a long hairy tail. His nearest relative is the *Condylura* (Star-nosed Mole), whose nose has a fringe of star-shaped processes round its outer edge, about twenty-two in number.

The first and only place I ever met with this strange little fellow was on the Chilukweyuk Prairies. These large grassy openings or prairies are situated near the Fraser River, on the western side of the Cascade Mountains. In the sandy banks on the edge of the Chilukweyuk River and the various little streams winding through the prairie-grass, lives the *Urotrichus*; his subterranean home is a large space or hole excavated like a small cave, and lined with bits of dry grass and leaves. From the central residence roads are tunnelled away, radiating from it like the spokes of a wheel. His tunnels are not like those of the Mole; he never throws up heaps or mounds of earth in order to get rid of the surplus material; he digs as the Mole, but makes open cuttings at short intervals, about four or five inches long.

And now we shall see the use of those curiously formed scraper-like hind feet. As he digs out the tunnel with his trowel hands, he throws back the earth towards his hind feet. These, from their peculiar shape, enable him to back the dirt out of the hole, using them like two scrapers, only that he *pushes* the dirt instead of pulling it towards him. Having backed the dirt clear of the mouth of the hole, he throws it over the edge of the open cutting. After having dug-in some distance, and finding, I dare say, the labour of backing out rather irksome, he digs up through the ground to the surface, makes another open cutting, and then begins a new hole

or tunnel, and disappears into the earth again. When he has gone as far from his dormitory as he deems wise, he again digs up through and clears away the rubbish. This road is now complete; so he goes back again to his central mansion, to begin others at his leisure. It is very difficult to watch the movements and discover the feeding-time and food of an animal that lives almost wholly underground in the daytime; but I am pretty sure these tunnels are made for and used as roadways, or underground trails, for the purpose of hunting. He is a night feeder, and exposed to terrible perils from the various small Carnivora that prowl about like bandits in the dark—Stoats, Weasels, Martins, and Skunks. So, to avoid and escape these enemies, he comes quietly along the subterranean roadways, and cautiously emerging at the open cutting, feels about with his wonderful nose, and, I doubt not, guided by an acute sense of smell, pounces upon larvæ, slugs, beetles, or any nocturnal creeping things he can catch, and so, traversing his different hunting-trails during the night, manages in this way to fare sumptuously, safe from danger.

It is scarcely possible to imagine a more skilfully contrived hunting-system, to avoid danger and to facilitate escape, than are these tunnel trails with open cuttings; for the sly little hunter has, on the slightest alarm, two modes of flight at his disposal, one before and the other behind; and the fur, as I have already mentioned, lying as smoothly when stroked from tail to head as it does when turned in the natural direction, enables him to retreat tail first into his hole as easily as he could go adopting his usual mode of progression.

NOTICE OF A PORTION OF A NEW FORM OF ANIMAL (MYRIOSTEON HIGGINSII), PROBABLY INDICATING A NEW GROUP OF ECHINODERMATA. BY DR. JOHN EDWARD GRAY, F.R.S., F.L.S., ETC.

Four or five years ago the Rev. H. H. Higgins, of Liverpool, purchased in London a specimen which was shown at the time to several naturalists, and was pronounced by some to be the tail of a Ray (perhaps of *Urogymnus africanus*); and this determination seems to have been so far satisfactory that up to this period it has not been further described.

During a recent visit to the Free Museum at Liverpool the specimen attracted my attention, and Mr. Moore, the intelligent Curator of that institution, placed it in my hands for examination and determination; and the trustees of that institution have most kindly presented it to the British Museum. I was soon satisfied that it could not be the tail of a Ray, nor, indeed, a part of any vertebrated animal. The outer surface (and, indeed, the whole substance) is made up of a number of calcareous concretions, united together by anastomosing processes placed on the outside of an internal rather thick coat formed of longitudinal fibres, which is rather hard and firm when dry. The interior of the tapering tube is quite empty, without any septa or other divisions.

It is very unlike the skin of a cartilaginous fish, which is always a good firm skin, more or less studded with hard, imbedded, bony scales or processes, or the case of an *Ostracion*, which is formed of cartilaginous or horny tesseræ. The rounded surface, which has been regarded as the upper surface of the tail, is pierced with two series of small, rather unequal-sized, oblong holes, which look very like irregular ambulacra for the passage of the feet or tentacles of the animal which formed the body, as in the case of the Star-fishes; and yet, at the same time, these holes are very different from the ambulacral pores of those animals, which are always in pairs and surrounded by some special ossicles. Besides the holes on the rounded or upper edge, there are a few similar perforations, but smaller in size, on the sides of the thicker part of the tube.

The entire surface of the external skeleton is cribellated with small pores between the ossicles, as is the case with many *Asteriadae* and *Echinidae*. This porousness of the surface induced one of the naturalists to whom it was shown to suggest that it might be the shell of a gigantic Foraminifer, or the coral of one of the Polyzoa; but this opinion cannot be entertained, as the pores are very unlike the pores of those animals, and the large continuous internal cavity, which has been evidently occupied by some part of a larger animal, is totally opposed to such a theory.

I therefore propose to give it a name, in hopes that it may lead to a more perfect knowledge of the animal, and to characterize it thus:—

MYRIOSTEON, gen. nov.

Body, entire form unknown. The part alone known (fig. 1) is elongate, tapering, straight, rather compressed, rounded above, and flattened beneath; the sides and upper surface formed of convex tetragonal ossicles, united by short radiating branches; with four or five round pores round each ossicle; ossicles of nearly equal size in all parts of the surface.

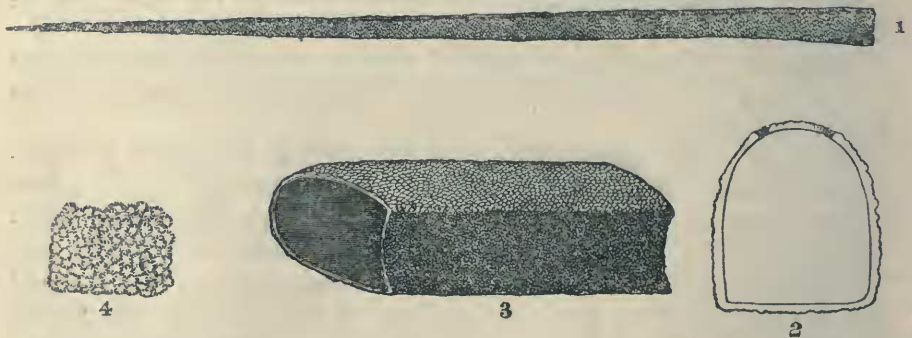


Fig. 1. The entire specimen, greatly reduced.
 2. Cross section of the specimen, natural size.
 3. Side view, showing the flat under surface.
 4. Figure of the surface, natural size.

The lower surface flat (figs. 2, 3, & 5), formed of smooth flat-topped tesseræ, which are very close together, forming a nearly continuous

surface, with circles of six triangular radiating pores near the margin of each ossicle—the ossicles near the thickest part of the body being the largest, and very gradually diminishing in size towards the top.

The ossicles are all placed on a rather solid, thick, hard internal layer, which is formed of closely intertwined short longitudinal fibres, or opaque bone-like spicula, which seem to give considerable rigidity to the body.

The convex upper edge has two longitudinal series of oblong pores, rather unequal in size, and sometimes placed so close together as to run nearly into one another, and at others separated from each other by a considerable interval. The larger pores are surrounded by a slightly raised edge, showing that some tentacle or other body is emitted through them. There are also a few smaller circular pores scattered on the sides of the tube.

MYRIOSTEON HIGGINSII, sp. nov. (Figs. 1–5.)

Hab. — ?

The fragment of this animal, which alone is known, is $26\frac{1}{2}$ inches long and 3 inches in circumference at the base, tapering to a rather blunt end, which is pervious; but it is evidently imperfect, and may be closed in the perfect state. The flattened part of the base is rather more than half an inch wide at its widest part.

I have named the specimen after the Rev. H. H. Higgins, one of the trustees of the Derby Museum at Liverpool, well known for his attachment to science.

I was soon convinced that the specimen was not the tail of a Ray, nor indeed any part of a vertebrated, annulose, or molluscosus animal; so that it must belong to the radiated group; and the question is to which part of the group it is most nearly allied.

The formation of the external skeleton and the general form of the parts which alone have as yet been examined lead me to believe that it is part of an Echinoderm, being probably the single ray of a radiated body. The structure of the external skeleton resembles more closely that of one of the more tessellated forms of the cylindrical-rayed Starfish than that of any other animal that has occurred to me; but it differs from the arms of these animals in not being provided with regular ambulacra, which is the essential character of the Starfish.

I am therefore induced to believe that the specimen may indicate a new group of radiated animals, nearly allied to *Asterias*. It appears to be much more rigid than the Starfish are in general; and it will at any rate form a new family, for which the name of *Myriosteida* may be given.

I do not recollect to have seen any fossil that has any resemblance to the specimen, or to the separate parts of it.

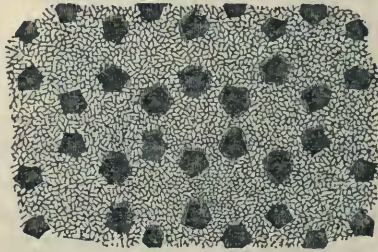
The ossicles differ also from those of *Asterias* in not being covered with granules, and from the *Asteriadae* and *Echinidae* in not being provided with spines on moveable joints.

The lateral edges of the flat portion of the specimen are more or less distinctly marked, and in some places, especially near the small end, are raised up into an irregular margin, formed by irregularities

on the surface of the ossicles, which at these places are more or less confused together.

The centre of the upper part of the smaller end of the specimen is marked with scattered concavities, which appear as if formed by its having been attached to some shell or other more or less convex surface. These concavities are produced by the flattening of the surface of the ossicles of the part. They may have been produced by parasites which have affixed themselves to the surface of the specimen, or by the specimen itself having been attached by the end of this part of the body to some fixed body. The pores on the back are more symmetrical and equal near the end of the arm, and those

Fig. 5.



Magnified figure of the under surface, showing the large pores placed in hexagons.

in each series are generally opposite to each other; but there are many exceptions to this arrangement and symmetry.

The *Myriosteon* can have no affinity to the Polyzoa, for there are no cells for the reception of the animal. The celebrated French zoologist who suggested that it might possibly belong to that order compared it with *Eschara*, the cells of which are obliterated by age; but then the cells are always well developed in the younger part of the coral.

The specimen under examination is clearly not a coral gradually increasing in size by the development of new cells, but a definitely-shaped part of some regularly formed body; so that the idea of its being a Polyzoon is scarcely worthy of as much consideration as I have given to it.

April 26, 1864.—John Gould, Esq., F.R.S., in the Chair.

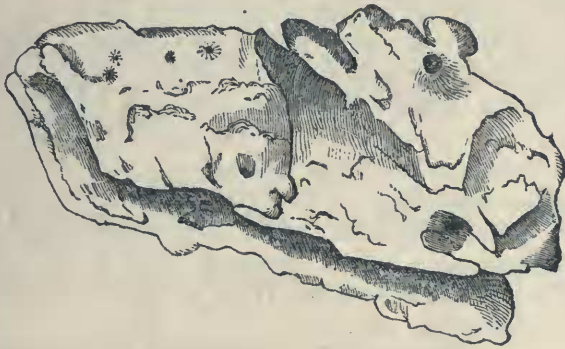
NOTE ON THE BONNET OF THE RIGHT WHALE.
BY DR. J. E. GRAY, F.R.S., F.L.S.

Mr. Holdsworth has presented to the British Museum a specimen which had been received from an American whaler, as “the Bonnet of *Balæna mysticetus*, obtained at the Sandwich Islands.”

I have shown the specimen to Professor Owen. He states that a similar specimen is in the Museum of the College of Surgeons, and that he considers it as “a diseased action or tumour of the outer layers of integument.”

The specimen is oblong, 11 inches long, and 8 inches wide, very irregular in the outline, with a very rough pitted surface, four of the

pits being much larger than the rest, and dividing the surface into six prominences. The whole substance seems to be formed of irregular horny layers placed one under the other, the lowest layer being the



one last formed ; and each of these layers is more or less crumpled and plicated on the surface, giving the irregular appearance to the mass.

The lower layer is attached to the skin of the whale, a part of the skin being attached to the inner surface of the mass, or bonnet, as it is called.

On showing the specimen to a foreign zoologist, he stated that it was an excrescence on the skin of a whale, formed by the adhesion of the barnacles called *Coronula*, and that the irregularities on the surface of the bonnet were caused by the attachment and wearing-action of these animals.

This is quite a mistake, the *Coronulae* sink themselves into the epidermis of the whale, as is also the case with the genus *Tubicinella*. I have seen numerous specimens of both these animals *in situ*, and the skin round the cirripedes is scarcely altered in structure, and offers no resemblance to the horny excrescence called the bonnet. Any one who examines the bonnet will find that the plate of horn of which it is formed is plicated and folded when deposited ; and this explains the irregularity of the general form of the body.

The zoologist referred to has since said that he believes it is caused by the irritation of the whale-louse, and that the irregularities on the surface are caused by them. This may perhaps have arisen from the surface of the specimen being covered with whale-lice when it was first procured from the whaler ; but this may be only because the hollow on the surface forms a good hiding-place for them ; and I think the supposition that they are the origin of the wart or horn requires further observation.

Mr. Holdsworth has since sent to the Museum a much smaller specimen, also obtained at the Sandwich Islands, which is oblong, elongate, and more symmetrical ; but the upper surface is not so evenly channelled. It is 6 inches long and $2\frac{1}{2}$ wide. It is spoken of by the whalers as a wart on the tip of the nose, and is commonly called the "Whale's bonnet."

I do not recollect observing any notice of this "*bonnet*," or giant corn, or rudimentary frontal horn, as it may be regarded, in any ac-

count of the "Right Whale," nor in that of the "Spermaceti Whale." I have specially searched for it again in the works by persons who have seen these Whales alive, but without success.

It has been suggested by Mr. Holdsworth that the bonnet may be a natural development, and possibly characteristic of the species; he thinks that the "pale prominence" on the nose of *Balæna antarctica*, as figured in 'Fauna Japonica,' pls. 28 & 29, may be intended to represent it. In the description this part is only described as "une forte proéminence teinte de blanc."

In the excellent drawing of the male Whale from the coast of New Zealand, which I figured under the name of *Balæna antipodarum*, in Dieffenbach's 'New Zealand,' vol. ii. t. 1, there is a rough roundish prominence on the front of the lower jaw, as well as on the front of the upper one.

I believe that a prominence of the kind is to be observed in all the species of the genus *Balæna*, although I have never seen them described as hard and horny; but that is no reason why this may not be the case.

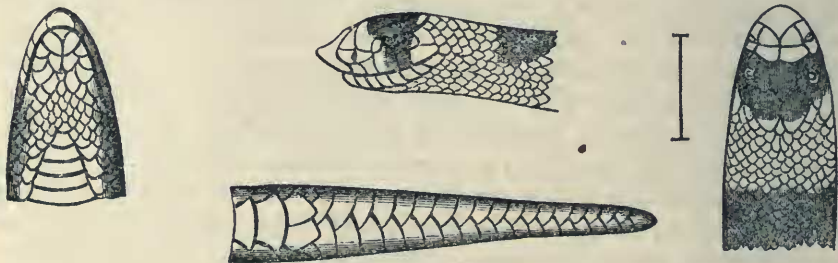
DESCRIPTION OF THREE NEW SPECIES OF AUSTRALIAN SNAKES.

BY GERARD KREFFT.

SIMOTES AUSTRALIS, sp. nov.

Scales in 17 rows. Ventrals 160 to 163. Anal bifid. Subcaudals 18/18. Total length $11\frac{1}{2}$ " ; tail $1\frac{1}{8}$ ".

Body cylindrical, rounded; head short, conical, not distinct from neck; tail short, ending in a blunt point. Rostral shield much pro-



duced, flat in front, pointed behind, reaching backwards to between the anterior frontals, slightly grooved at its base. Two nasals, nostrils between, one anterior, two posterior oculars; two temporals (in one specimen a third smaller one behind). Eye small; pupil subelliptical, erect; no loreal, replaced by the posterior nasal and anterior ocular; six upper labials, the third and fourth coming into the orbit; occipitals short, not much rounded behind, and but slightly forked. The general colour is red, very bright on the posterior part of the body and tail; all the scales are slightly margined, some, much darker than others, have a whitish (in spirits) spot in the middle, and form into a series of half rings, of which there are about fifty-six upon the body and tail. The head is covered by a black band across the occiput, leaving the snout free, commencing from below

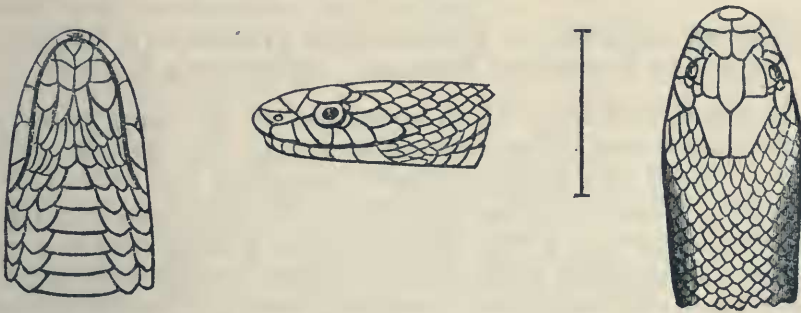
the eye, and marking the fourth and fifth upper labials, the vertical, and nearly the whole of the occipitals; this black band is divided from a second band covering the neck by a whitish space.

I believe the present species is the first *Simotes* discovered in Australia; and I am much indebted to Dr. James C. Cox, who found it in the neighbourhood of Port Curtis. A second specimen, taken on the banks of the Clarence River, was given to me a few days ago by Judge Francis.

HOPLOCEPHALUS RAMSAYI, sp. nov.

Scales in 15 rows. Anal bifid. Ventrals 164. Subcaudals 51. Total length $10\frac{1}{2}$ " ; tail 2".

Body rather elongate and rounded; head scarcely distinct from



neck, rather high and elongate, with obtuse muzzle; rostral just reaching to the surface of crown; anterior frontals moderate, rounded in front; posterior ones larger, bent down on the sides; one anterior, two posterior oculars, the lower forming about one-fourth of the orbit; vertical narrow, six-sided, much longer than broad; superciliaries nearly the same size as the vertical; occipitals moderate, not forked behind; six upper labials, the third and fourth forming the lower part of the orbit; no loreal, replaced by the elongate nasal, second and third upper labial, anterior ocular, and bent down anterior frontal. One nasal, pierced by the nostril; scales moderate, rhomboid, in fifteen rows; tail rather short, scarcely distinct from trunk, tapering; eye moderate, pupil rounded; grooved fang in front, some smaller smooth teeth behind.

Dark olive-green above, each scale tipped with reddish, in particular those on the sides; crown and a narrow vertebral line, one scale wide, somewhat darker than the other parts; this line extends to the root of the tail; upper labials and chin-shields whitish, marked with olive-brown in the upper corners. Beneath yellow, each ventral scale with a blackish margin; subcaudals nearly black.

Mr. E. P. Ramsay discovered this new Snake in the neighbourhood of Braidwood, N. S. Wales; it is apparently a young specimen, its total length not exceeding $10\frac{1}{2}$ inches.

HOPLOCEPHALUS NIGRO-STRIATUS, sp. nov.

Scales in 15 rows. Anal entire. Ventrals 180. Subcaudals 62. Total length 11" ; tail $2\frac{1}{2}$ ".

Body and tail as in *H. nigrescens*; belly flat; tail moderate, not distinct from trunk; head not distinct from neck, depressed, rounded; rostral moderate; anterior frontals broad, hinder edges just touching the nostril; posterior frontals much larger, rounded behind; vertical moderate, six-sided, very broad; occipitals rather narrow, elongate, much forked and pointed behind; one anterior, two posterior oculars; superciliaries and eyes small; pupil elliptical, erect; six upper labials, third and fourth touching the eye. Upper part of posterior half of tail covered with large hexagonal scales; sides and beneath yellowish white; crown and a vertebral line running from the neck to the tip of the tail black.

Hab. North-east Australia, neighbourhood of Rockhampton.

NOTES ON AUSTRALIAN FRESHWATER FISHES, AND DESCRIPTIONS OF FOUR NEW SPECIES. BY GERARD KREFFT.

The scanty knowledge which we possess of the fishes inhabiting our freshwater streams has induced me to pay some attention to this subject; and I now furnish a list of species of the several rivers from which I have received specimens. To begin with our immediate neighbourhood, I find that up to the present time not more than four species have been captured in the streams emptying into Port Jackson and Botany Bay:—namely, *Eleotris australis*, sp. nov.; *Mugil dobula*, Gthr.; *Anguilla australis*, Rich.; and *Galaxias scribea*. These four species we find in almost every stream, swamp, and lagoon, *Galaxias scribea* even in old wells or other water-holes on the top of hills, which have no connexion with any of the running streams. *Anguilla australis* is also frequently found in detached pools of water; whilst *Eleotris australis* frequents the clearer streamlets. I have never had an opportunity of examining the creeks which are situated upon the north shore of Port Jackson, nor have I ever received specimens captured there; but I have reason to believe that, besides the four kinds of fish mentioned, there exists a larger freshwater species, commonly called “Perch,” probably a *Therapon*, which is not found in the salt water of the harbour.

With regard to the fishes of the Nepean or Hawkesbury, its tributaries, and the swamps and lagoons with which this river is occasionally connected during high floods, I am enabled to give a better account. I have drawn the seine in the Hawkesbury between Windsor and Richmond, about fifty miles from its mouth, where the water is as fresh as that of any mountain-stream; and the result was, at a haul, about 200 so-called “Mulletts” (two species, *Mugil dobula*, Gthr., and *Mugil compressus*, Gthr.), two “Eels” (*Anguilla australis*, Rich.), a “Perch” (*Lates colonorum*, Gthr., Ann. N. H. 1863, xi. p. 114), and a “Rock Cod” (*Dertropogon robustus*, Gthr.). How this last fish managed to go so far up a freshwater river I could not understand. It has all the appearance of a true sea-fish; and yet I took it subsequently much further up the river, between the mountains, whilst I have also received two specimens captured with

hook and line in Mr. Pitt's lagoon near Bronte—a lagoon which, Mr. Pitt informs me, has not been flooded during the last four years. There is another fish, called a "Bream" by the settlers, which we did not succeed in capturing (this is probably *Beryx affinis*), and a second species of Perch, which may prove to be new. At a second haul a true Flat-head (*Platycephalus tasmanius*, Rich.) was secured, besides the usual amount of "Mullet" and "Perch." The smaller fry, as *Galaxias scriba*, Rich., and the so-called Sprat (*Megalops setipinnis*, Rich.), were taken with hook and line. The last-mentioned species affords a good deal of sport, as it will rise to a fly. I mention this fact, as some authors have denied that fly-fishing existed in Australia.

The genus *Eleotris* I found well represented in this river; and I give a short description of four new species.

ELEOTRIS COXII, sp. nov.

D. C. $\frac{1}{9}$. A. 1/9. L. lat. 36 to 38.

Twelve series of scales between the origin of the posterior dorsal and the anal. Head scaly; snout obtuse, with the lower jaw prominent. The height of the body is contained five times and a quarter in the total length; the length of the head more than four times; the horizontal diameter of the eye is one-fourth of the length of the head, and equal to the width of the interorbital space.

Coloration bright yellow; upper part and sides finely punctured with black, forming a broad, sometimes indistinct streak upon the sides. Dorsals and pectorals bright yellow at the base, the first punctured with black; belly whitish. Teeth villiform, in broad bands. Anal papilla large, somewhat longer than broad.

Total length $5\frac{1}{4}$ inches.

Hab. Lagoon near Bronte, Upper Hawkesbury River.

ELEOTRIS AUSTRALIS, sp. nov.

D. $7\frac{1}{8}$. A. $\frac{1}{8}$. L. lat. 32.

Eight series of scales between the origin of the posterior dorsal fin and the anal. Head scaly, as far as the snout, obtuse; lower jaw prominent; teeth in villiform bands. The height of the body is contained four times and a half in the total length, and the head four times and a quarter; the horizontal diameter of the eye is one-half the width of the interorbital space. General coloration yellowish brown, covered with minute black spots, which form five or six longitudinal lines upon the sides; base of pectorals with a narrow bright yellow band; all the rays of the caudal spotted with black; second dorsal with three or four narrow, sometimes indistinct bands. Anal papilla as long as the horizontal diameter of the eye, and nearly as broad. Total length 5 inches.

Hab. Creeks near Sydney, Hawkesbury River and its tributaries, Hunter River, and Clarence River.

ELEOTRIS GRANDICEPS, sp. nov.

D. 7 1/9. A. 1/9. L. lat. 38 to 40.

Twelve series of scales between the origin of the posterior dorsal fin and the anal. Head very large, broad, depressed, without any apparent scales; lower jaw prominent; teeth villiform. The height of the body is contained five times in the total length, and that of the head three times and a half. The diameter of the eye is one-fifth of the length of the head, and nearly one-half of the interorbital space; the pectorals reach to the origin of the anal fin. General coloration yellowish, punctured with black in particular on the upper part and sides; snout blackish; lower jaw sometimes punctured with black also; beneath whitish. Anal papilla very small. Total length 3½ inches.

Hab. Upper Hawkesbury River; freshwater lagoons near Bronte and Richmond, Eastern Creek, and other tributaries of the Hawkesbury.

There are just twelve species of fishes from the Nepean and Hawkesbury; but I am assured by Mr. George M. Pitt, jun., to whom I am chiefly indebted for my specimens, that the river contains more than twenty different kinds of fish: the remaining species I hope to capture during the course of this summer, and I shall furnish an account of them in due time. Of our northern rivers the Hastings, the Richmond, and the Clarence I know but little; that they teem with fish there is no doubt, and that many new genera and species will be found amongst them is certain. Many of the settlers upon the banks of these streams have promised their cooperation; and Mr. James F. Wilcox, who resides on the Clarence River, has supplied me already with many interesting specimens. I received from him *Oligorus macquariensis*, Cuv. & Val., *Therapon unicolor* (?), *Galaxias scriba*, Rich., *Eleotris mogunda*, Rich., and *E. compressus*, sp. nov., which may be described as follows :—

ELEOTRIS COMPRESSUS, sp. nov.

D. C. 1/9 to 10. A. 1/10. L. lat. 28/30.

Eight series of scales between the origin of the posterior dorsal fin and the anal. Body cyprinoid, compressed; the height of the body is contained three times and three-quarters in the total length, and the head four times; the horizontal diameter of the eye is one-fourth of the length of the head, and is contained once and a half in the interorbital space; the snout is short, lower jaw longest; mouth rather small; head scaly.

Coloration reddish brown, with five or six indistinct cross bands, formed of the close-dotted black spots with which the scales are covered. The second dorsal and the anal are rather long, and more or less marked with black at the base and top; besides this, the hinder

part of the second dorsal is speckled with white. Anal papilla of moderate size and forked. Total length $3\frac{1}{2}$ inches.

Hab. Clarence River, and creeks near Port Denison. Discovered by Mr. James F. Wilcox.

DESCRIPTION OF A NEW SPECIES OF THE GENUS MERGUS.

BY JOHN GOULD, F.R.S., ETC.

MERGUS SQUAMATUS, Gould.

Crown of the head, lengthened crest, and neck rusty brown; upper surface brownish grey; tuft of feathers at the insertion of the wing grey, passing into white near the tip, and broadly margined with black; lesser wing-coverts grey; greater coverts grey at the base, passing into black about the middle of the feathers, beyond which they are creamy white; primaries very dark or blackish brown; lower part of the throat and all the under surface pale buff; sides of the breast and the whole of the flanks down to the tail deep rich buff, with two narrow irregular crescentic bands of blackish brown on each feather, one within the other, the outer one near the edge, the inner one near the middle; a similar style of marking pervades the space behind the legs, the lower part of the back, and the upper tail-coverts, but the markings in those parts are wider, of a greyer tint, and intermingled with each other; tail greyish brown, the central feathers freckled on their margins with greyish white.

Total length 23 inches; bill $2\frac{3}{4}$; wing 10; tail $4\frac{1}{2}$; tarsi 2.

Hab. China.

Remark.—The above description was taken from an example which I consider to be either immature or in its winter livery. In size it is intermediate between *Mergus castor* and *M. merganser*. Whenever a specimen is procured in its nuptial dress, it will doubtless prove to be a bird of great beauty. This new species is at once distinguished from the other members of its genus by the squamate form of the markings on the flanks, which has suggested the specific name assigned to it.

May 10, 1864.—Dr. E. Hamilton in the Chair.

ON A NEW RAT FROM FORMOSA. BY ROBERT SWINHOE, F.Z.S.

MUS CONINGA, n. sp.

M. corpore supra rufo, setis nigris spinosis sparso, subtus abrupte albo: auribus rotundis, fuscis: cauda longa, squamosa, setosa: pedibus albis.

Corp. long. 8 poll., caud. 9 poll.

Upper parts reddish brown, sprinkled with stiff black bristles, more especially on the back, where the fur is also often a little dark; ears and fore part of legs deep brown; tail composed of short rings of scales set with short stiff bristles, deep brown on its upper parts, whitish on the lower and for about $1\frac{3}{4}$ inch of tip; a ring of black runs round the lids of the eye; whiskers on sides of muzzle and a

few hairs on sides of the forehead very long and glossy black; fore teeth rufous sienna, those on lower jaw long; chin, breast, under fore paws, belly, and under thighs pure white; paws white, the hinder ones large.

In a young animal, measuring $6\frac{1}{2}$ inches in trunk, the tail measured 6 inches; head to fore root of ear $1\frac{1}{2}$ inch; between ears $\cdot 7$ inch; length of ear $\cdot 8$ inch; greatest breadth of ear $\frac{1}{2}$ inch; hind foot, from tibial joint to end of nails, $1\cdot 4$ inch. As the animal attains its full size, the tail exceeds the trunk in length. I have examined about thirty-five specimens of different ages; the younger the animal, the fewer spinous bristles: of these the males carry most; they are sharp and very stiff. Amongst these specimens there is, as usual, an amount of variation; but in proportions it is not very appreciable, except in so far as to be accounted for by age. In colour, on the contrary, varieties abound: the most strongly marked are the following:—

1. Sides strongly freckled with olive-yellow.
2. Brown, with more or less reddish; fur softer, with few bristles.
3. Similar to 1, but with brown instead of white fur.
4. Similar to 1, with white-and-brown feet and white-patched tail.
5. Characters of nos. 2 and 1 united.

These five varieties are so linked together by intermediate forms that there is no drawing a line between them. When I received the first soft-furred brown Rat, I thought I had got a distinct creature; but I soon procured others combining the characters of both. The colour and softness of its fur led me to conjecture that it might be a race of which the ancestors had hybridized with *Mus decumanus*, because I received a specimen of this last animal from the same locality. But the acquisition of further specimens showed me that, from the unsullied whiteness of its belly and the intermediate tinges of the upper parts of many others, the difference only consisted in a slight variation in the colour and appearance of the fur, the other characteristics of the species remaining unaltered. This Rat is not now found in the vicinity of towns, whence, like the indigenous Rats of most countries, it has fallen back before the usurpation of the stronger hordes of the commercial Rat (*Mus decumanus*); and it is now only found in the isolated hamlets of the interior, whither its enemy appears gradually to be extending its sway. It is difficult to understand how so large and strong a Rat has been ousted out of its rights by a not much stronger usurper. This species must have occurred formerly in towns in pretty considerable numbers, as it still does in country places. The imported hordes of *Mus decumanus* could not have been in larger numbers, but I should fancy must have employed a superior cunning to deprive these of their territory—much the same sort of advantage, probably, that civilization gives the Chinaman in this country, and the whites in Australia, which enables them to drive into the mountains and bush the rightful but less expert possessors of the land of their fathers. This Rat is allied to the aboriginal Rat of Southern China (*Mus flavescens*, Gray), and doubt-

less of the same stock ; but it attains a larger size, is robuster, has larger hind feet, larger ears, and is otherwise distinguished by its feet being white, and by the pure abrupt white of its under parts. The bristles of its upper parts are also more numerous and more spinous. It was, perhaps, originally brought over by Chinese junks, and drove before it some other species, of which some few may yet be found lingering about the huts of the savages of the interior. For, in former days, before the accession of western commerce, *M. flavescens* was doubtless the chief Rat of the towns of Southern China ; and special circumstances may have caused it to vary ; or its pedigree may perhaps be carried further back to the time when there must have been more territorial connexion between this island and the main, when *Lepus sinensis*, *Cervulus Reevesii*, and others managed to get across and remain to this day in either country identical and unchanged in form. These, however, are merely conjectures ; but the facts remain that *Mus Coninga* is allied to *M. flavescens*, and that both have been banished from their accustomed haunts by the cosmopolite usurper, *M. decumanus*.

The Formosan Rat is distinguished by the Chinese colonists from *M. decumanus*, which they call *Laou chee*, by the name *Pay-ba*, or white belly. The country-people attribute medicinal properties to its flesh, and value its carcase at fourpence a piece. I propose to name the animal after the powerful pirate chief who seized the island from the Dutch, and whose nightly rest this indigenous species must have as greatly disturbed as do its commercial successors those of the present trading community.

ON A NEW SPECIES OF WHITE COCKATOO LIVING IN THE SOCIETY'S GARDENS. BY P. L. SCLATER, M.A., PH.D., F.R.S., SECRETARY TO THE SOCIETY.

In April of the year before last the Society obtained from the ship 'La Hogue' (as recorded in the 'Proceedings' for May 13, 1862)* a pair of a fine large species of White Cockatoo, new to the collection. Somewhat influenced, I must confess, by the information that they had been brought to Sydney from the Salomon Islands, I was induced to refer these birds to the *Cacatua Ducorpsii*, obtained by MM. Hombron and Jacquinot in that group of islands, and described by those naturalists in the Zoology of the 'Voyage au Pôle Sud,' although they did not quite agree with the characters and figure there given of that species.

On its return voyage this year the same ship has brought over a pair of smaller White Cockatoos, received at Sydney from the island of Guadalcanar, of the Salomon group. As soon as I saw them, I was at once convinced that I had made a mistake in referring the former pair of birds to *Cacatua Ducorpsii*, and that the latter pair were rightfully entitled to that designation. It thus becomes neces-

* See P. Z. S. 1862, p. 141.

sary to give a new name to the Cockatoo which I have heretofore erroneously called *Ducorpsii*, and figured under that name in the 'Proceedings' for 1862. I propose, therefore, to call it *Cacatua ophthalmica*, as its most distinguishing characteristic when living is the blue naked skin which surrounds the eye, and renders it at first sight distinguishable from every other bird of the genus.

Before giving the specific characters of this new species, I may remark that the White Cockatoos, of the genus *Cacatua*, may be divided into two very easily distinguished sections. The first embraces those species which have a narrow medial head-crest, with the slender point recurved at the extremity, and appearing above the surface of the adjoining feathers when the crest is in a state of repose. The second contains those species which have the crest broadened and comprising the greater part of the head-feathers, rising when erect into a sphere more or less pyramidal in shape, but showing when in a state of repose no recurved point. The following diagnoses may assist in determining the species :—

Sect. A. *Crista angustata ad apicem recurva.*

Majores candidæ, crista flava	{	1. <i>galerita</i> , ex Australia.
Minores candidæ, crista aurantiaca...		2. <i>triton</i> , ex Nov. Guinea et Molucc.
	{	3. <i>citricristata</i> , ex Timor.
crista flava		4. <i>sulphurea</i> , ex Timor, Flores, Lombock et Celebes.
Major, crista tricolore	{	5. <i>æquatorialis</i> , ex Nov. Guin. et Molucc.
		6. <i>Leadbeateri</i> , ex Australia.

Sect. B. *Crista lata incumbente.*

Candida major; crista alba	7. <i>cristata</i> , ex Ternate.
crista rubra	8. <i>moluccensis</i> , ex Ceram, Batchian et Ternate.
crista limonacea ...	9. <i>ophthalmica</i> , ex ins. Salomon.
minor; crista alba, intus limonaceo tincta ...	10. <i>Ducorpsii</i> , ex ins. Salomon.
genis rubro tinctis ..	11. <i>sanguinea</i> , ex Australia.
crisso rubro	12. <i>Philippinarum</i> , ex ins. Philipp.
Rosacea	13. <i>roseicapilla</i> , ex Australia.

The new species may be shortly characterized as follows :—

CACATUA OPHTHALMICA, sp. nov.

Cacatua Ducorpsii, Sclater, P. Z. S. 1862, p. 141, pl. xiv.

Alba : *cristæ plumis elongatis, intus pallide limonaceis* : *subalaribus et caudæ tectricibus inferioribus limonaceo tinctis* : *rostro et pedibus nigris* : *annulo oculari in ave viva cæruleo* : *crassitie vix minore quam in Cacatua cristata.*

Hab. In ins. Salomon.

In conclusion I may remark that the Society's living series of Cockatoos contains examples of nine out of the thirteen known species, the deficiencies being only four, namely, *C. triton*, *C. sulphurea*, *C. sanguinea*, and *C. Philippinarum*.